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A COMPARATIVE STUDY OF THE ORAL READING BEHAVIOR OF VERBAL DOMINANT AND PERFORMANCE DOMINANT CHILDREN

by

CAROL ELIZABETH MALLETT

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Comparative Study of the Oral Reading Behavior of Verbal Dominant and Performance Dominant Children submitted by Carol Elizabeth Mallett in partial fulfilment of the requirements for the degree of Master of Education

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ABSTRACT

The teaching of reading and planning of appropriate reading programs demands a knowledge and consideration of each learner's abilities and learning strategies. The intellectual abilities of children have been identified as important determinants of achievement in reading. Some children become reading disability cases because differences in their intellectual abilities are not realized and because the school environment does not make the most of their potential.

The Wechsler Intelligence Scale for Children (WISC) is a multi-factor intelligence test that provides both verbal and nonverbal scores. Significant differences between these scores are thought to express real differences in learning abilities which are reflected in classroom performance. Research literature reviewed indicated that although the relationship between intelligence and reading has been examined in the past, little has been revealed concerning the reading behavior of children who have significant differences in their verbal and nonverbal abilities.

Oral reading provides an insight into the reading process and how children learn to read. It was the purpose of this study to investigate certain aspects of the oral reading behavior of children identified as having different

learning abilities on the basis of their verbal and non-verbal discrepancy profiles on the Wechsler Intelligence Scale for Children.

The sample tested in this study was fifty matched pairs of students ranging in age from seven to ten years and found in thirty-nine schools in the Edmonton Public School System, the Edmonton Separate School System and the St. Albert Protestant Separate School District. Subjects were designated as Verbal Dominant and Performance Dominant according to their intelligence quotients on the WISC which was administered by school psychologists in each school system.

The test sample was administered the Gilmore Oral Reading Test, Form C, the instrument used to assess the reading performance of subjects for words in paragraph format. Also administered was the Word Lists Test, the instrument devised to assess reading performance for words in isolation. Statistical analyses using Fisher's z values and one-way analysis of variance were carried out on the data.

The findings of the study indicated that there were statistically significant differences in the oral reading behavior of subjects when performance was measured according to overall reading achievement. Verbal Dominant subjects were found to be better readers than were Performance Dominant subjects. It was also indicated by the

findings that while both groups of children make the same types of errors, each group appears to have a distinct pattern in types of errors made most often. Further, both groups have the ability to use self correction strategies as indicated by no significant differences in the self correction of errors on words in lists and in paragraphs. Statistically significant differences in the subjects' ability to read words in lists and then in paragraphs were not found.

The findings of this study suggest the need for further investigation of the reading abilities of these children in order that more appropriate instructional strategies can be devised to teach these children to read.

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Chapter I

PURPOSE OF THE STUDY

Few people would contest the statement that reading is one of the most important subjects in the curriculum of the elementary school. Success in reading determines, to a large extent, success and progress in most other school subjects. How do children read? Why does one child experience success in reading and another child with seemingly the same potential fail in reading? The challenge that these questions and others pose to those concerned with teaching children to read is reflected in the large amount of research that has been conducted to identify factors thought to be associated with success or failure in reading.

A basic consideration in determining reasons for success or failure in reading is the uniqueness and individuality of each child not only in things he knows but in capabilities for learning. School teachers, faced daily by individual differences in children, are constantly aware of the actuality and importance of individuality. This is apparent in the many and varied ways that teachers attempt to adjust teaching methods, and more recently, teaching goals to these individual differences. Because most of the objectives of schools are focused on mental

skills rather than on physical or social ones, educators realize that of all the kinds of differences be they emotional, social, physical or mental, the intellectual ones are of greatest significance (Thomas, 1965, p. 4). Not only are individual differences in intelligence reflected in differences in general scholastic achievement (Jensen, 1973, p. 72) but in success in reading.

De Hirsch (1966) found intelligence to be a significant predictor of reading success in her important work on predicting reading failure. Correlations between mental test scores and early success in reading have been reported in a number of studies and range from about .40 to .55 (Russell, 1961) and as high as .80 (Strang, McCullough and Traxler, 1955). Monroe (1932) found a substantial relationship between mental maturity and reading scores of elementary school children. These findings give evidence then that intellectual differences in children and success in reading are related.

Several perplexing problems arise in the study of the relationship between intelligence and reading achievement. Children with average or better intelligence sometimes experience considerable difficulty in reading while children with lower levels of intellect manage to learn to read amazingly well. Cossitt found in her study of the reading achievement of fourteen pairs of twins in grade one that "a high intelligence does not guarantee success

in reading" (Cossitt, 1966, p. 44). It has also been found that children with similar levels of intelligence often achieve quite differently in reading (Debruler, 1968). The answers to these problems might be explained in part by the theory that intelligence varies qualitatively with different individuals as well as in degree (Heim, 1954, p. 163). This suggests the need for more intensive research concerned with further identifying and analyzing those components of intelligence which may reflect differences in reading behavior.

Valuable insights can be gained into the process of reading as it functions in individual readers through the observation and measurement of their oral reading behavior. As a reader reads orally he makes two kinds of responses, those that correspond to the expected response and those that do not (Allen, 1970, p. 1). Those responses which do not correspond to expected responses are produced through the same process as are expected responses. Goodman and others (Goodman, 1967; Burke, 1969; Weber, 1968, 1970; Allen, 1970; Davey, 1971) have carried out rather extensive analyses of oral reading errors, assuming that these errors provide essential information concerning the strategies the reader uses in selecting and processing information and the ways readers interpret the printed page. What few studies have done is to investigate and analyze the oral reading errors of children exhibiting

different intellectual abilities as detected through the use of an individually administered intelligence test to determine whether differences exist in the way these children process information.

STATEMENT OF THE PROBLEM

The Wechsler Intelligence Scale for Children is used widely as a measure of intelligence, especially of children referred because of reading problems. It would seem advisable, therefore, to explore both the general relationship of the WISC to reading achievement, and to ascertain which specific information from the WISC profiles could be used in making pedagogical decisions about the needs of learners encountering difficulty in reading. While previous studies suggest that Verbal Dominant subjects tend to perform better in reading than Performance Dominant subjects, both types of learners do encounter problems in reading. We do not have information about the specific differences in the way these two groups of learners read. Specifically, the present study attempts to (1) determine the differences, if any, in the frequency and types of oral reading errors made by Verbal Dominant and Performance Dominant subjects when reading words in list and/or paragraph format, and (2) to determine the differences, if any, in the self

corrections of errors of these two groups of subjects when words are read in isolation and/or in context.

DEFINITIONS

A number of terms having specific meaning and used frequently in this study are defined as follows:

1. Verbal IQ: refers to the measurement of those subtests on the WISC representing verbal comprehension, and other abilities related to language-centered achievement.

2. Performance IQ: refers to the measurement of those subtests on the WISC which require the interpretation and/or organization of visually perceived materials (Cohen, 1959, p. 287).

3. Full Scale IQ: refers to a composite of Verbal and Performance scores to indicate a general intelligence rating as determined by the WISC.

4. Verbal Dominant: refers to those subjects in the study having a thirteen point or more difference between Verbal IQ and Performance IQ with Verbal IQ being higher.

5. Performance Dominant: refers to those subjects in the study having a thirteen point or more difference between Verbal IQ and Performance IQ with Performance IQ being higher.

6. Dominant IQ's: refers to the Verbal IQ for

Verbal Dominant subjects and to the Performance IQ for Performance Dominant subjects.

7. Secondary IQ's: refers to the Performance IQ for Verbal Dominant subjects and to the Verbal IQ for Performance Dominant subjects.

RESEARCH QUESTIONS AND HYPOTHESES

Four major research questions were devised to guide the collection of data and presentation of findings of the analysis of the data for this study. In order to explore each research question more fully a number of null hypotheses were also formulated. The four research questions and their corresponding null hypotheses are as follows.

Research Question I

The first research question asks whether or not there will be differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance is measured according to the subjects' scores for reading accuracy and reading comprehension on the Gilmore Oral Reading Test.

Null Hypothesis 1a. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by reading accuracy scores on the Gilmore Oral Reading Test.

Null Hypothesis 1b. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by reading comprehension scores on the Gilmore Oral Reading Test.

Research Question II

The second research question asks whether or not there will be differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance on the Gilmore Oral Reading Test is measured according to

1. the total number of errors in paragraph reading,
2. the nature of the error, including
   (a) substitutions
   (b) mispronunciations
   (c) words pronounced by the examiner
   (d) disregard of punctuation
   (e) insertions
   (f) hesitations
   (g) repetitions
   (h) omissions
3. the total number of self corrections of errors in paragraph reading,
4. the nature of the self corrected error.

Null Hypothesis 2a. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant

children when performance is determined by the total number of errors in paragraph reading.

Null Hypothesis 2b. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the nature of the error in paragraph reading, including

(a) substitutions
(b) mispronunciations
(c) words pronounced by the examiner
(d) disregard of punctuation
(e) insertions
(f) hesitations
(g) repetitions
(h) omissions.

Null Hypothesis 2c. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the total number of self corrections of errors in paragraph reading.

Null Hypothesis 2d. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the nature of the self corrected error in paragraph reading, including

(a) self correction of substitutions
(b) self correction of mispronunciations
(c) self correction of disregard of punctuation
(d) self correction of insertions
(e) self correction of omissions.

Research Question III

The third research question asks whether or not there will be differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance on the Word Lists Test is measured

according to

1. the total number of errors for words in isolation,

2. the nature of the error, including

   (a) substitutions

   (b) mispronunciations

   (c) omissions,

3. the total number of self corrections of errors for words in isolation,

4. the nature of the self corrected errors for words in isolation.

Null Hypothesis 3a. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the total number of errors for words in isolation.

Null Hypothesis 3b. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the nature of the error for words in isolation, including

(a) substitutions
(b) mispronunciations
(c) omissions.

Null Hypothesis 3c. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the total number of self corrections of errors for words in isolation.

Null Hypothesis 3d. There will be no significant differences in the oral reading behavior of

Verbal Dominant children and Performance Dominant children when performance is determined by the nature of the self corrected errors for words in isolation, including
(a) self correction of substitutions
(b) self correction of mispronunciations.

Research Question IV

The fourth research question asks whether or not there will be differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance on the Word Lists Test and then on the Gilmore Oral Reading Test is measured according to categories

1. Words missed on lists and words missed in paragraphs

2. Words corrected on lists but missed in paragraphs

3. Words missed on lists but corrected in paragraphs

4. Words corrected on lists and read correctly in paragraphs.

Null Hypothesis 4. There will be no significant differences in the oral reading behavior of Verbal Dominant Children and Performance Dominant children when performance is determined by the categorization of errors for words read in lists and then in paragraphs, including categories
1. Words missed on lists and words missed in paragraphs
2. Words corrected on lists but missed in paragraphs
3. Words missed on lists but corrected in paragraphs

4. Words corrected on lists and read correctly in paragraphs.

LIMITATIONS

The following factors are recognized as possible limitations in this research.

1. The sample selection for the current study included both boys and girls, however it was not possible to account for this factor in matching subjects because of the predominate number of boys in the clinic population from which the sample was drawn. The sex factor may influence oral reading behavior apart from variables identified.

2. Although subjects were matched as closely as possible on intelligence quotients, differences in Dominant IQ's do exist particularly for those pairs in the superior and very superior ranges of intelligence. Since these differences are slightly in favor of Verbal Dominant children, they may raise reading accuracy and comprehension levels of the Verbal Dominant group.

3. Many children in the sample had been referred to school psychologists for intellectual assessment in light of low achievement levels displayed in the classroom. Generalizations from this "clinic" population to an "average" population must therefore be very restricted.

4. Differences between Verbal and Performance IQ's for each child may be subject to variability due to

possible errors of measurement (Seashore, 1951, p. 65).

SIGNIFICANCE OF THE STUDY

The wide range of capacities, abilities, and approaches to learning of children in any classroom seems to necessitate a differentiated approach to reading instruction at all school levels. What is needed is more information about those differences in learners which may guide us in making appropriate instructional decisions. This would be particularly true for children already identified as having reading problems, such as those of the clinic population from which Verbal Dominant and Performance Dominant children in this study were drawn.

More specifically, should the study show differences in oral reading behavior as indicated by (a) number and types of errors in word lists and in paragraphs, and (b) self corrections of errors of Verbal Dominant and Performance Dominant children it may be possible to ascertain more clearly how these children approach the reading task in their attempt to gain meaning from the printed page. This information may help teachers and other remedial personnel to further develop appropriate teaching strategies for working with these two kinds of learners.

OVERVIEW OF THE STUDY

Chapter I has presented the purpose of the study, definitions, research questions and corresponding null hypotheses which were formulated to guide the study, limitations, and significance of the research.

Chapter II contains a review of the literature which is considered pertinent to the establishment of the background of this study.

Chapter III presents an outline of the experimental design of the study as well as information concerning characteristics of the sample, and the nature and administration of the tests involved.

The findings of the analysis of data for the study will be presented in Chapter IV.

The final chapter, Chapter V, will present conclusions of the study, implications for teachers and suggestions for further research.

CHAPTER II

THEORETICAL BACKGROUND AND RELATED RESEARCH

The purpose of this chapter is to provide a background for the investigation of the relationships between differences in children's intellectual abilities and various aspects of their oral reading behavior. The chapter will review literature that has examined possible causal factors for severe reading difficulties or disability in children. Research concerned with the relationship of intelligence and reading, and particularly of intellectual abilities as reflected by verbal and nonverbal intelligence test scores to reading will also be reviewed.

Pertinent to this chapter will be an examination of the measurement of reading ability with emphasis on those oral reading tests from which it is possible to describe what happens when a reader reads orally. Consideration will be given to research which described the reading behavior of children when reading word lists and paragraphs, and to the distribution of types of errors made in reading.

FACTORS CONTRIBUTING TO READING DIFFICULTY

Success in reading is determined to a great extent

by a child's intellectual, physical, social and emotional development. It also depends on the child's proficiency in language, his sensory equipment, his wide background of personal experience, his motivation to read and his learning experiences in the school (Dechant, 1970, p. 40). That these factors are closely interrelated is obvious. Dechant says that a child must have reached a certain point of development or readiness in each of these areas because "each in its own way may contribute to reading disability or prevent future growth" (Dechant, 1970, p. 40).

Multiple Causative Factors

Just as there is no single factor which determines a child's success in reading, nor is there any single or isolated factor which causes reading difficulty (Robinson, 1946; Dechant, 1970; Kasdon, 1970). Many researchers have attempted to isolate and clarify single factors which have contributed to the reading disability of their subjects. Morris (1970) compared health records of 400 children attending reading clinics with 400 non-retarded readers of similar age, intelligence and socio-economic background. He found that retarded readers had a history of 1.73 more physical defects and incidents of illness than did his control group. Michal-Smith, Morgenstein and Karp (1970) found a hereditary factor as contributing to severe disability in four siblings. Guthrie and Goldberg

(1972) suggested that reading disability may derive from a lack of co-ordination among three different memory functions which are required for reading. They compared 81 normal and 43 disabled readers and found significant positive associations between visual sequential memory and paragraph comprehension, oral reading and word recognition. Bazemore and Gwaltney (1973) tested the hypothesis that there is no specific personality factor, of those measured, which discriminates the disabled and non-disabled readers. From a sample of sixty-eight children in grades three to six they found normal readers more conscientious and more "tender-minded" than disabled readers. The results of these studies, however significant, do not suggest that these factors exist in isolation and are the sole causes of disability. Rather they are present as significant contributing causes of reading difficulty.

Approximately thirty years ago Helen Robinson conducted a study to identify and measure various causal factors for underachievement in reading in a group of thirty severely retarded readers (Robinson, 1946). With the help of a number of specialists she found multiple causes for reading disability. Maladjusted homes or poor interfamily relationships were contributing causes in 53% of the cases; visual anomalies were found in 70% of the cases but were determined to be causal factors in only one

case; in 20% of the cases neurological problems were thought to interfere with learning; speech and functional auditory factors were possible contributing causes in 46% of the cases; physical factors were found in 30% of cases; and in 43% there was found to be emotional problems which may have caused or equally have resulted from reading failure. Conclusions of the study were that the most seriously retarded of the subjects showed the greatest number of anomalies. However, complete agreement was not reached as to which specific factors caused the disability in the retarded readers.

Several researchers have investigated the relationship between a combination of selected variables and retardation in reading achievement. Bell, Anderson and Lewis (1972) found in their study of 100 Junior High School subjects that inadequate readers had verbal deficits, came from low socio-economic status homes and adopted a pattern of aggressiveness, negativism or passivity to their reading disability. The relationship of socio-economic status to poor reading achievement has also been observed by Deutsch (1963).

Developmental and psychological differences were found between readers and nonreaders in research by Hunter and Johnson (1971). Twenty nonreading boys were matched with twenty reading boys. The nonreaders were less confident, 35% hyperactive, and exhibited higher incidences

of mixed laterality and of reading and language problems at home. They were also deficit in attention and concentration. De Hirsch (1966) in studying eight children showing massive reading difficulties at the end of grade two found that the perceptuo-motor and linguistic responses of these children were unstable. She also found the developmental and psychological growth of these children immature or retarded.

As evidenced, four broad factors have been identified as determinants for achievement in reading: experiental background, physical development, neurological adequacies, emotional and social development. A fifth factor, the intellectual development of a child, is also recognized among the more important factors relating to reading achievement (Dechant, 1970, p. 40).

Intelligence as a Causal Factor

Among those factors often associated with the presence of reading difficulties in children is their level of intellectual development. Dechant (1970) and Durkin (1970) suggest that a child needs certain intellectual skills in order to achieve in reading. Many of the desired products of reading are dependent on perceptual skills in perceiving likenesses and differences, and in remembering word forms, on memory skills for retention and recall of what was read, and on intellectual processes such as reasoning, comparing, contrasting, generalizing,

inferring, categorizing and the like. Those children who are mildly retarded or who possess dull normal or borderline mental ability are usually viewed as having learning problems in the school setting (Rice, 1970, p. 16) and as such may exhibit difficulty with some of the skills and processes required for reading. "Those with an IQ below 50 will experience difficulty with abstract materials; and those with IQ's between 50 and 70 rarely will be able to read above a fourth-grade level" (Dechant, 1970, p. 49). To a certain degree, then, less than normal IQ places a limit on attainment in learning to read. Research also reveals that a high intelligence does not guarantee success in reading (Cossitt, 1966; Dechant, 1970). Rice states that "approximately 20 percent of the school population with normal or better mental ability have serious reading deficiencies" (Rice, 1970, p. 15). Researchers suggest then that intelligence in itself may not be a direct cause of reading difficulties or disabilities but that it may lead indirectly to disability.

Because intelligence has been found to be one of the key factors which plays a role in every child's achievement in reading, further investigation of the relationship between intelligence and reading seems warranted.

INTELLIGENCE AND READING

The Relationship Between Intelligence and Reading

That reading is, among other things, an intellectual task has already been suggested. Correlations between intelligence and reading ability generally vary from about .35 in the first grades to about .65 in the sixth grade (Dechant, 1970, p. 49). Bruininks and Lucker (1970) suggest that reading achievement and intelligence test scores are moderately related with correlations ranging from .40 to .60. They found in their study of thirty-six subjects participating in an experimental reading project that by the end of grade four, 35 to 40 percent of the variance in reading performance could be explained by differences in IQ scores (Bruininks and Lucker, 1970, p. 301). Similar results were reported by Toussaint in her investigation of the relationship between reading, listening, arithmetic and intelligence. Thirty-five to thirty-seven percent of variance in reading was found to be predictable from IQ. Further, she reported coefficients of correlation between reading and intelligence significant at the .01 level of confidence (Toussaint, 1961).

Strang's investigation of the relationship of aspects of intelligence to reading revealed correlations of .80 to .84 between the language factors of intelligence and reading and correlations of .36 to .56 between nonlanguage factors and reading (Strang as cited by Bond

and Tinker, 1957, p. 111). These findings suggested to Strang that the language part of the intelligence test (California Test of Mental Maturity) measured one kind of mental ability and the nonlanguage part measured a different type of ability (Strang as cited by Toussaint, 1961, p. 16). Support for these findings was given by Hage and Stroud (1959). Using the Lorge-Thorndike Intelligence Test and the Iowa Tests of Basic Skills they obtained correlations of .82 with verbal intelligence test scores and .57 with nonverbal intelligence test scores.

In summary, it is apparent that reading achievement tends to be positively related to intelligence at all academic levels. However on the basis of rather large differences in correlations between language factors of intelligence and reading and between nonlanguage factors and reading as reported by Strang in Bond and Tinker (1957) and by Hage and Stroud (1959), it is possible that variabilities in reading performance might be explained in part in terms of different aspects of intelligence as detected through the use of multi-factor intelligence tests.

Measures of Intelligence

Although the existence of individual differences in the mental characteristics of children and adults has been apparent to psychologists for many centuries, it has not been until the early 1900's that these differences

have been studied experimentally or "subjected to quantitative measurement" (Freeman, 1934, p. 1). Francis Galton was one of the first to influence the direction of experimental attempts to measure intelligence through the development of tests of abilities in imagery and in sensory discrimination (Ibid., p. 8). Although his tests appeared to focus on specific factors peculiar to each type of task, his statistical devices did furnish the basis for more sophisticated methods of analysis.

The first intelligence scale was constructed in 1905 by Binet who had observed that intelligence manifests itself in a multitude of ways and who wished to determine the interrelations of the various processes in each individual. Binet recognized the need of tests which varied as much as possible not only in subject matter but also in the form of answers required (Heim, 1954, p. 22). His test, known as the 1905 Binet-Simon Scale, reflected that need by employing tasks which exercised many mental processes. Although Binet had established a means of identifying differences in mentality, and differences in the levels of development of children of various ages, his test was criticized because of its linguistic nature. Some questioned why certain types of mental processes should be singled out more than others thus implying that individuals who were more skillful with their hands were less intelligent than those able to function

successfully with abstractions. Performance tests were subsequently devised so that some measure of a perceptual situation might be provided (Freeman, 1934, p. 28).

The Wechsler Intelligence Scale for Children, published in 1949, provides measures of both linguistic, verbal or language factors and perceptual factors. According to Wechsler (1949) general intelligence is not a unitary trait or ability. This theory is reflected in the composition of the Scale with twelve subtests grouped into a Verbal Scale and a Performance Scale. Verbal tests are fairly homogeneous as to abilities measured as are tests that correlate with the Performance Score (Seashore, Wesman and Doppelt, 1950, p. 103).

Individual mental tests have been found to be the most suitable measures of intelligence to be used with reading cases. Of the many individual mental tests available for use in schools and clinics, the Revised Stanford Binet and the Wechsler Intelligence Scale for Children (WISC) have found wide acceptance among psychologists working with children. According to Bond and Tinker however, the Stanford Binet presents appreciable difficulty for children with severe reading difficulties especially on items "directly related to reading growth such as: vocabulary, reading and memory, abstract words, dissected sentences" (Bond and Tinker, 1957, p. 75). Similar findings were not reported by them for the WISC. Rather

one of the advantages of the WISC appears to be that it is "minimally influenced by the subject's inability to read" (Simpson, 1970, p. 363). The WISC seems to be widely accepted and used not only as a measure of intelligence but as a clinical diagnostic instrument for determining the strengths and weaknesses of children.

It was decided that the WISC would be a profitable instrument for determining the general intelligence of children in this study and for appraising their intellectual abilities according to their performance on the Verbal and Performance Scales.

Verbal and Nonverbal Components of Intelligence

One of the most important developments in the measurement of intelligence in the past three decades has been the breaking down of a general intelligence quotient into separate measures. Because intelligence is often appraised by a single score, the intelligence quotient has been criticized as representing a global rather than a differentiated evaluation of a child's potential (De Hirsch et al, 1966). Thus with tests that are largely verbal or language-centered, the single intelligence quotient fails to take into account many important aspects of perceptual functioning that are related with early success or failure in reading. Multi-score intelligence tests, on the other hand, frequently provide quotients based on verbal material and on nonverbal material. The

WISC is an example of a multi-score intelligence test. It provides not only a Full Scale intelligence quotient (IQ) representing general intelligence but a Verbal IQ and a Performance IQ representing verbal and nonverbal or perceptual aspects of intelligence.

While there does not appear to be evidence that educators provide more effective and efficient instruction when they have both verbal and nonverbal scores available rather than a single quotient, Gundersen and Feldt suggest that the additional information gained from profiles of intelligence is of potential value for planning differential instruction particularly when that information is associated with profiles of achievement (Gundersen and Feldt, 1960, p. 115).

Verbal and performance abilities. On the basis of evidence that differences between quotients are related to classroom performance, Gundersen and Feldt (1960) examined the achievement correlates of four groups of fourth-grade children with marked differences in verbal and nonverbal intelligence test scores. They found that the groups had widely varying abilities which were revealed in different ways. Although children who were highly proficient in language skills were recognized as superior in language centered areas of achievement, those children who evidenced superiority in favor of nonlanguage intelligence were thought to possess equally highly developed abilities

which could be recognized and used to the children's advantage. The study suggested that observed differences between verbal and nonverbal intelligence quotients may express real differences in abilities which are reflected in classroom performance.

It has already been stated that verbal tests correlated with the WISC Verbal Scale are fairly homogeneous as to the abilities they measure as are nonverbal or performance tasks that are correlated with the Performance Scale (Seashore, Wesman and Doppelt, 1950, p. 103). It is assumed, therefore, that differences between Verbal and Performance intelligence quotients on the WISC reflect real differences in abilities. The question arises, however, as to how big differences must be between Verbal-Performance test scores to contribute to differences in abilities. The most pertinent evidence of the significance of the differences between quotients comes from Seashore (1951) and from Silberberg and Feldt (1968).

Seashore (1951) examined the differences between Verbal and Performance IQ's of the 2,200 children in Wechsler's standardization research. He observed that the means of observed Verbal-Performance differences were essentially zero and that the standard deviations of the distributions of these differences were fairly uniform at 12.5 points of IQ for all ages (Seashore, 1951, p. 63).

The implications of his research were that similar differences might be expected between Verbal and Performance IQ's for children at all ages and that Verbal IQ's will be greater than Performance IQ's just as often as Performance IQ's will be greater than Verbal IQ's (Ibid., p. 64). Seashore's findings suggested that there would be little difficulty in locating a population from which to draw the sample for this study.

Silberberg and Feldt (1968) used the WISC in their study of the frequency of reading impairment in children who revealed certain intellectual and perceptual characteristics. They used a thirteen point difference between Verbal and Performance intelligence quotients to define a group of children as High Performance where Performance IQ was thirteen points higher than Verbal IQ. They found the thirteen point difference in their study to be statistically significant utilizing a .05 level of confidence.

No other studies were found which based the grouping of children on a thirteen point difference between Verbal and Performance intelligence quotients. However, on the basis of findings by Seashore and by Silberberg and Feldt that a thirteen point difference between Verbal IQ and Performance IQ is not only a close measure of the standard deviation of differences for all ages (Seashore, 1951) but is statistically significant at the .05 level

of confidence (Silberberg and Feldt, 1968), it seems plausible that differences of thirteen points of IQ or more between the two quotients are due to real differences in abilities. Therefore children in this study who showed a difference between their Verbal and Performance IQ's of thirteen points or more with Verbal IQ being the larger were thought to have abilities which differed significantly from those children whose Performance IQ was the larger of the two quotients.

Verbal and Performance Differences and Achievement in Reading

It is frequently observed by school personnel and clinicians working with children described as having reading difficulties that these children often have significantly lower verbal scores than nonverbal scores on standardized intelligence tests which yield both verbal and nonverbal intelligence quotients. Results indicating that the verbal scores of retarded readers are significantly lower than their nonverbal scores are also common to many studies (Neville, 1961, p. 195). As previously reported in this chapter, Gundersen and Feldt (1960) observed that children with nonverbal superiority were not as proficient in reading as those with verbal superiority. Neville (1961) compared the WISC performance of thirty-five matched pairs of retarded and nonretarded readers. He found that retarded readers do best on

subtests of the WISC clearly removed from verbal skills. Similarly, Debruler (1968) reported in his investigation of the relationship between Verbal and Performance scores on the WISC and reading ability that verbal scores tend to be lower among retarded readers than among successful readers. While agreement is evident in the findings of these studies, the results are not conclusive as revealed by the recent research of Silberberg and Feldt (1968) and of Ackerman, Peters, and Dykman (1971).

Silberberg and Feldt (1968) investigated the relationship of a Performance-Verbal discrepancy pattern on the WISC with reading problems. They hypothesized that a child with a high Performance IQ—low Verbal IQ profile based on a thirteen point difference between quotients, would evidence difficulties with reading. Reading achievement was measured by performance on the Wide Range Achievement Test (WRAT). Results of their investigation showed that a significantly higher Performance I.Q. than Verbal IQ was not significantly related to frequency of reading disorders.

In their study of the WISC profiles of children with specific learning disabilities, Ackerman, Peters and Dykman (1971) examined the Verbal-Performance differences found for learning disabled children and academically achieving controls. They used a fifteen point separation between quotients to categorize a child as either Verbal

dominant or Performance dominant. Although the researchers found that "learning disabilities stem from verbal deficiencies much more frequently than from non-verbal deficiencies . . ." (Ackerman, Peters and Dykman, 1971, p. 163), they also found that an adequate Verbal IQ on the WISC does not assure success in reading. Some 63 percent of their learning disabled sample had Verbal IQ's of one hundred or higher; 27 percent scored one hundred ten or higher on the Verbal Scale.

While several studies have compared WISC Verbal-Performance discrepancy profiles of children described as retarded readers or learning disabled with profiles of normal readers (Neville, 1961; Silberberg and Feldt, 1968; Ackerman, Peters and Dykman, 1971) only one was found which made a comparative study of the reading achievement of children grouped according to basic profile patterns on the Verbal and Performance sections of the WISC. Wells (1971) selected one hundred fifty-eight children for inclusion into three groups on the basis of WISC profiles. Two of the groups exhibited Verbal-Performance differences of fifteen points or more with Verbal IQ being larger in one group, and Performance IQ being larger in the second. The third group was established as a control with neither Verbal or Performance IQ's being larger. The reading section of the Wide Range Achievement Test (WRAT) was administered to all children

in the sample. Analysis of reading test scores showed that significant differences existed between reading scores and WISC profile patterns. Those children with a dominant Verbal IQ scored higher on the WRAT than did those with a dominant Performance IQ. While this study gives a general indication of differences in the level of reading performance of children with Verbal-Performance discrepancy profiles on the WISC, it does not give an indication of whether the differences in abilities of these children affect their focus of attention in processing information.

Summary

Intelligence has been identified as a key factor in the reading success of children at all grade levels. The measurement of intelligence by a multi-factor intelligence test such as the Wechsler Intelligence Scale for Children has revealed that large differences between verbal and nonverbal intelligence quotients in children may reflect real differences in abilities. Differences of thirteen points between Verbal and Performance intelligence quotients were found to be statistically significant at the .05 level of confidence in a study (Silberberg and Feldt, 1968) which based the grouping of children on a Verbal-Performance discrepancy profile of thirteen points. While there is evidence that the verbal scores of children with reading difficulties

are significantly lower than their nonverbal scores, a significantly higher Verbal IQ than Performance IQ does not assure success in reading.

Noticeably lacking in research which examines the relationship between intelligence and reading is an attempt to explore some of the qualitative differences in the reading behavior of children who have significant differences in their verbal and nonverbal abilities. There has been little contributed to an understanding of the reading process and how these children learn to read.

THE MEASUREMENT OF READING ABILITIES

With the growing number of research studies examining the reading behavior of selected groups of children, educators have become increasingly aware of the effect of individual differences on the reading achievement of children in the same grade or class. The major task of teachers and of reading teachers in particular is the individualization of instruction based on an understanding of these individual differences. This necessitates not only a diagnosis of each child's abilities but an assessment of the level of reading performance of the individual and an evaluation of individual strengths and weaknesses. An individually administered intelligence test such as the WISC will give an indication of the abilities of each child; survey tests, informal and standardized oral reading

tests will give an indication of what a child can or cannot do in reading.

The kind of reading test chosen to measure reading performance depends primarily on what the examiner wishes to know about the child's performance. If a measure of general achievement level is needed, survey tests are frequently employed. If, however, a measure of not only general achievement but of specific reading strengths and weaknesses is desired, then oral reading tests are of particular value. An examination of research related to this study has revealed that both types of tests have been used to measure reading performance. A brief description of survey tests in general, of informal oral reading tests and of standardized oral reading tests follows as it was from this group of tests that the measure of reading performance for subjects in this study was selected.

Selection of the Reading Measure

Survey tests give a general picture of reading achievement by identifying broad areas in which a child excels or is weak (Dechant, 1970, p. 458). Typically they are comprised of subtests that deal with areas of reading as paragraph comprehension, reading vocabulary, speed and accuracy. The use of survey tests in research concerned with the relationships between intelligence and reading has been considerable. Gundersen and Feldt (1960) used the Iowa Tests of Basic Skills to assess achievement

in reading, vocabulary and language for children categorized according to language and nonlanguage intelligence quotients on the California Short-Form Test. The Wide Range Achievement Test was used by Burks and Bruce (1955) and by Silberberg and Feldt (1968) to define selected readers as deficient or nondeficient. Wells (1971) also used the Wide Range Achievement Test to investigate whether or not there would be significant differences in the reading scores of children grouped according to Verbal-Performance discrepancy profiles on the WISC. The information gained from use of these tests has been valuable in describing the level of performance of subjects in each particular research, however little has been determined from the obtained scores concerning the reader's actual processing of information in reading.

One of the most widely used diagnostic procedures in determining the level and manner of reading behavior is that of oral reading. Since there is evidence that oral responses reflect basic reading ability (Weber, 1968, p. 103) an analysis of a child's oral reading helps establish the level of the child's performance, his knowledge of vocabulary, comprehension of material and specific strengths or weaknesses. Generally, passages are selected from unfamiliar material and questions are prepared to measure comprehension. Not only can deficiencies in sight vocabulary, phonetic and structural analysis,

phrasing and comprehension be determined (Dechant, 1970, p. 463), but an insight into the child's processing of written language can be gained through an analysis of his or her errors (K. Goodman, 1965, 1969).

Individually administered informal oral reading tests have been used frequently by researchers (K. Goodman, 1965; Y. Goodman, 1967; Goodman and Burke, 1969; Burke, 1969; Weber, 1970) in their examination of the oral reading behavior of selected subjects. In most instances, passages to be read orally were selected from an unfamiliar reading series or from various texts of instructional material. An indication of each child's comprehension of material, when checked, was obtained by having the subject retell the story in his or her own words. The focus of attention in these studies was the analysis of oral reading errors to determine how the reading process functioned in the individual readers at that particular time. Analysis of errors was based on the assumption that every error a child makes in oral reading is caused and that unexpected responses are achieved through the same process as expected responses. Categorizing reading errors according to K. Goodman's Taxonomy of Miscues was done to show possible causes for the errors (Y. Goodman, 1967, p. 30). Use of the complex and time consuming taxonomy necessitated a relatively small number of subjects in each study.

Standardized oral reading tests (Gray, 1922;

Gilmore, 1968; Robinson, 1963) possess many of the same advantages as informal oral reading tests. They not only give an indication of a child's level of performance in accuracy of word identification and in comprehension of orally read material, but provide a record of the errors made by each child. Although these tests produce systems of classifying reading errors which are not as highly detailed as Goodman's Taxonomy, an analysis of errors for quality and type is possible. The Gilmore Oral Reading Test (Gilmore, 1968) is an example of a standardized oral reading test used commonly by reading clinicians. It was chosen as the measure of oral reading performance of subjects in this study because it is administered easily and quickly, provides scores for oral reading accuracy and comprehension, and represents a record of each child's errors. A more thorough description of the Gilmore is provided in chapter three.

Oral reading behavior on word lists and paragraphs. The question arises whether or not differences exist in the relative ability of children to recognize words in context and to recognize words presented in isolation. When reading words in context, the reader is able to use information available in the structure of words and in the flow of language; when reading words in isolation, the reader has only the information within the printed words available to him. K. Goodman (1965) examined this

aspect of oral reading behavior in one hundred children in grades one, two and three. He selected a sequence of stories to be read orally by each child. A word list from each story was duplicated as part of the reading task. Subjects were asked to read first from the word list, and then from the story on which the word list was based at a level of comparable difficulty. It was assumed by Goodman that children would read many words in stories that had not been recognized correctly on lists because of additional information within the flow of language. Results of his study indicated that the average child at all three grade levels read correctly in paragraphs a large percentage of those words not recognized on lists.

The possibility exists that children who differ significantly in their language centered or verbal abilities may also differ significantly in their ability to recognize those words in context that were missed in isolation. Children with dominant language centered abilities may be able to read words in stories which they had missed on lists far more readily than those children with dominant visual-perceptual abilities. A major concern then, of the present study was to investigate whether differences are apparent in the ability of children identified as Verbal Dominant and Performance Dominant to recognize words presented in context which had initially not been recognized in isolation.

Distribution of Error Types

There is evidence in research that the types of oral reading errors made by selected groups of children are of a quantitative rather than a qualitative nature in that none of the types of reading errors recorded are made exclusively by only one group (Malmquist, 1958; Weber, 1968). There is also evidence, however, that children of the same age and grade level may have distinct patterns in the distribution of error types because of differences in certain selected variables such as response style (Butler, 1973; Hood et al, 1973). It could well be then, that children with equivalent intellectual capactity but who are either very perceptual in orientation or function at an inferential, abstract level have different patterns in the distribution of the types of errors which they make in reading. A search of the literature revealed a neglect in the investigation of this aspect of individual differences and the effect that these differences have on the types of responses that children make as they interact with printed material.

SUMMARY

Research pertinent to this study has revealed that children possess widely varying abilities which are reflected in their performance on multi-factor tests of intelligence such as the Wechsler Intelligence Scale for

Children. Differences of thirteen or more points between Verbal and Performance intelligence quotients on the WISC have been shown to be significant for establishing Verbal and Performance ability profiles. Although research has shown that the WISC has frequently been used to investigate the performance of good and poor readers on its various subtests, little has been revealed concerning the performance in reading of children who differ significantly in their verbal and performance abilities.

The reading behavior of children can be determined by an analysis of their performance on oral reading tests. In particular, the examination of oral reading errors provides valuable insights into the reading process as it functions in individual readers at any given time (Goodman, 1969, p. 12). The Gilmore Oral Reading Test is a measure of oral reading performance and provides a system for the classification of oral reading errors. Hence it is possible to examine and compare the type and frequency of errors made by selected readers.

K. Goodman asserts that a consideration of the individual abilities of children is essential in understanding how children learn to read (Goodman, 1965, p. 639). A neglect in research of the oral reading behavior of children has been a consideration of differences in verbal and nonverbal abilities and the

effect these have on responses children make to printed material.

CHAPTER III

DESIGN OF THE STUDY

This chapter describes the design of the study, including sample selection, the test instruments, methods of data collection and the analysis of the data.

OVERVIEW

The main purpose of the study was to compare the differences, if any, in the oral reading behavior of two groups of children identified by their WISC scores as Dominant Verbal or Dominant Performance. General reading achievement in terms of word recognition accuracy and comprehension scores on a standardized oral reading test was assessed. Further, the types of errors and their frequency of occurrence during oral reading of paragraphs and corresponding word lists, as well as self corrections of errors, were studied because of their qualitative contributions to the analysis of oral reading.

The sample consisted of two matched groups of twenty-five subjects each. One group of subjects displayed a Verbal-Performance difference of thirteen or more points with the Verbal IQ being larger and the other group displayed a Verbal-Performance difference of thirteen or more points with Performance IQ being larger. The subjects in

the Verbal Dominant group were matched as closely as possible with the subjects in the Performance Dominant group according to age, dominant Verbal and Performance scores on the WISC, Full Scale IQ, and the point differences between their Verbal and Performance IQ's.

THE WISC

In this study, sample selection was based on intelligence quotients of subjects on a standardized intelligence test. The WISC was selected because it provided a total IQ as well as a Verbal and Performance IQ. It was also selected as the instrument of intellectual measurement because of its wide use by school psychologists in the geographical area in which this study was done.

Organization of the WISC

The WISC consists of two parts, a Verbal Scale and a Performance Scale. The Verbal Scale requires a subject to receive verbal information aurally and to respond to questions orally. The Performance Scale is presented to the subject in visual, nonverbal form. Responses of the child on the Performance Scale are in the form of pointing or of manipulation of material.

Each scale has five required subtests and one supplemental subtest. Verbal IQ scores are computed on the basis of subtests:

1. Information

2. Comprehension
3. Arithmetic
4. Similarities
5. Vocabulary
6. Digit Span (Supplement).

Performance IQ scores are based on subtests:

7. Picture Completion
8. Picture Arrangement
9. Block Design
10. Object Assembly
11. Coding
12. Mazes (Supplement).

While in the standardization of the WISC all twelve subtests were used to calculate Verbal IQ, Performance IQ and Full Scale IQ, in the interests of shortening administration time only ten of the subtests are usually given with Digit Span (Verbal) and Mazes (Performance) being deleted or used as alternates. Both the twelve subtest and ten subtest administration procedures were used with subjects in the present sample. Where the twelve subtest administration was used, the scores were prorated so as to be comparable to ten subtest scores.

Computation of Intelligence Quotients

In calculating Verbal, Performance and Full Scale IQ's, subjects' raw scores on the five Verbal subtests and the five Performance subtests are converted to scaled

scores which are summed and a mean and standard deviation of sums computed. These sums are then converted into a distribution of IQ's with a mean of 100 and a standard deviation of fifteen. The same procedures are applied using ten subtest scores to determine a Full Scale IQ. Thus the WISC provides Verbal, Performance and Full Scale IQ's which are comparable for all age groups.

While the Verbal and Performance abilities measured by the WISC are not mutually exclusive, correlations between the Verbal score and the Performance score suggest that the abilities in each cannot readily be inferred from each other (Seashore, Wesman and Doppelt, 1950, p. 103). A major limitation of the WISC especially as it relates to this study is the possibility that real differences in the abilities tested may be due to errors of measurement. The standard error of measurement for the Verbal IQ is reported to be approximately three points and for the Performance IQ about five points. What this means is that the thirteen point difference between Verbal IQ and Performance IQ selected for this study in identifying Verbal Dominant and Performance Dominant subjects could be reduced to a five point difference. Conversely the real value differences between Verbal and Performance scores could be as high as twenty-one points. Within this limitation it was assumed that the IQ's assigned to each subject in the sample were respresentative of their abilities.

Reliability and Validity

The reliability of the composite Verbal and Performance scores based on a split-half co-efficient is reported by Buros in the .80's and .90's respectively. For Full Scale scores, Buros reports reliability in the .90's (Buros, 1959, citing G. Patterson, p. 559). Further, indications are available that "the test will probably satisfy the major requirements of internal consistency, reliability and validity" (Ibid., p. 560).

Administration of the WISC

The subjects in the sample were administered the WISC by trained personnel (school psychologists) during the school year from January 1973 to March 1974. Sample selection was carried out in April 1974.

THE SAMPLE

The sample was drawn from a clinic population comprised of all seven to ten year old pupils who had been referred by their teachers or other school personnel for intellectual assessment in the Edmonton Separate School System, the Edmonton Public School System, and the St. Albert Protestant Separate School District during the 1972-73 and beginning 1973-74 school years.

Because the three school systems use different procedures for maintaining records of special services, the procedures followed by the investigator in locating

subjects had to be modified accordingly. The Edmonton Separate School Board (E.S.S.B.) allowed the researcher to search the placement files. The Edmonton Public School Board (E.P.S.B.) has a decentralized system but allowed a search of records in the eight different Bureaus of Child Study. The St. Albert Protestant Separate School Board searched their own files.

Twenty-two children who met stated criteria were located in E.S.S.B. records. Eighty-six subjects were located through Bureau files of the E.P.S.B. and one child was referred from St. Albert. Thus 109 children were identified as meeting the requirements of the study. However, of the 109 subjects identified, only twenty-five children had a Verbal Dominant WISC profile. While this number was lower than anticipated, it undoubtedly reflects the basic nature of the clinic population from which the sample was drawn. Most children are referred because of school learning problems and previous research suggested that Verbal Dominant pupils do not experience as many such problems. Because of this limitation it was necessary to select twenty-five Performance Dominant subjects who matched as closely as possible those twenty-five Verbal Dominant subjects. Subjects were matched on five major criteria including:

1. dominant WISC IQ score
2. secondary WISC IQ score
3. Full Scale IQ

4. the point difference between dominant and secondary WISC IQ scores

5. chronological age.

During the course of the study three of the Performance Dominant subjects were not available for the later testing sessions and were subsequently replaced by pupils who most closely matched the Verbal Dominant subjects. The data for each final matched pair are shown in Table 1. Examination of the data will show that a clear cut match in all cases was not possible.

The mean Verbal, Performance and Full Scale IQ scores, and the mean differences between groups on Verbal, Performance and Full Scale IQ scores are reported in Table 2. These data show that the two groups were closely matched. Of greater significance is the finding of greater variability between the mean Verbal scores of the two groups than between mean Performance scores.

Table 3 indicates the means and variances for point differences between Verbal IQ's and Performance IQ's for the two groups.

To determine whether significant differences existed between the means of differential point scores for the two groups, a one-way analysis of variance was carried out. The data shown in Table 4 indicate a close matching of the point differences between differential point scores of Verbal Dominant and Performance Dominant

TABLE 1

MATCHED PROFILES OF VERBAL DOMINANT AND PERFORMANCE DOMINANT SUBJECTS ACCORDING TO INTELLIGENCE QUOTIENTS, POINT DIFFERENCES BETWEEN VERBAL AND PERFORMANCE IQ'S, AND AGE

Verbal Dominant Subjects					Performance Dominant Subjects				
Verbal IQ	Performance IQ	Full Scale IQ	Point Difference	Age	Performance IQ	Verbal IQ	Full Scale IQ	Point Difference	Age
92	78	84	14	7- 7	97	80	87	17	7- 1
103	90	96	13	8- 2	103	85	93	18	8- 2
103	90	96	13	8- 8	100	85	91	15	8- 1
101	85	93	16	9- 6	101	85	92	16	9- 3
96	62	78	34	9- 8	96	71	81	25	9- 6
108	79	93	29	9- 8	106	87	96	19	9- 4
103	90	96	13	9- 9	100	86	92	14	9- 6
108	89	99	19	7- 4	110	90	100	20	7- 8
110	93	102	17	7- 4	110	96	103	14	7-10
113	97	106	16	7-11	118	96	107	22	7-10
113	96	105	17	8- 8	113	99	106	14	8- 4
113	99	107	14	9- 2	114	96	105	18	9- 0
111	94	104	17	9- 4	110	94	101	16	9- 3
115	101	109	14	9- 6	117	99	108	18	9- 7
116	94	107	22	9-11	118	94	106	24	9- 4
123	110	118	13	9- 6	118	104	112	14	9- 7
129	107	120	22	8- 3	124	111	119	13	8- 3
121	106	115	15	8- 9	122	103	113	19	8- 9
135	118	130	17	9- 0	131	114	124	17	9- 7
121	108	117	13	9- 3	122	101	112	21	9- 1
124	103	115	21	9- 9	124	97	111	27	9- 4
120	100	112	20	9- 8	121	101	112	20	9- 3
145	115	134	30	7- 9	133	95	115	38	8- 3
149	136	147	13	8- 8	136	121	131	15	8- 4
130	115	125	15	8-11	132	105	120	27	9- 1

TABLE 2

MEAN IQ SCORES AND MEAN DIFFERENCES BETWEEN IQ SCORES FOR THE TWO GROUPS VERBAL DOMINANT AND PERFORMANCE DOMINANT

WISC IQ's	Verbal Dominant	Performance Dominant	Mean Difference
Verbal IQ	116.08	95.80	20.28
Performance IQ	98.20	115.04	16.84
Full Scale IQ	108.32	105.48	2.84

TABLE 3

MEANS AND VARIANCES OF POINT DIFFERENCES IN INTELLIGENCE QUOTIENTS FOR VERBAL DOMINANT AND PERFORMANCE DOMINANT CHILDREN

Group	Means	Variances
Verbal Dominant	17.88	33.11
Performance Dominant	19.24	31.69

TABLE 4

SUMMARY OF ANALYSIS OF VARIANCE ON POINT DIFFERENCE SCORES FOR VERBAL DOMINANT AND PERFORMANCE DOMINANT GROUPS

Source	SS	MS	df	F	p
Between Groups	23.12	23.12	1	.71	<0.40
Error	1555.21	32.40	48		

subjects. These results are highly desirable as sample selection was based in part on a close matching of point difference scores for each pair of children.

Table 5 shows the mean point difference between dominant scores (Verbal IQ's for Verbal Dominant subjects and Performance IQ's for Performance Dominant subjects) for the two groups, and between secondary scores (Performance IQ's for Verbal Dominant subjects and Verbal IQ's for Performance Dominant subjects).

TABLE 5

MEAN DIFFERENCES BETWEEN DOMINANT IQ's AND BETWEEN SECONDARY IQ'S FOR VERBAL DOMINANT AND PERFORMANCE DOMINANT CHILDREN

	Verbal Dominant Group	Performance Dominant Group	Mean Difference
Dominant WISC IQ			
Verbal IQ	116.08		1.04
Performance IQ		115.04	
Secondary WISC IQ			
Verbal IQ		95.80	2.40
Performance IQ	98.20		

Again, results indicate a close match between Verbal Dominant and Performance Dominant subjects on the basis of dominant and secondary intelligence quotients.

The fifty children included in the sample were from varied socio-economic backgrounds as evidenced by the fact that subjects were distributed over thirty-nine

different schools throughout the greater Edmonton area.

Sex and age data are reported in Table 6.

The mean age for children in both the Verbal Dominant and Performance Dominant groups was eight years four months. An analysis of variance shown in Table 7 indicates no significant difference between means in ages for the two groups.

On the basis of the evidence in the files there was no indication that any of the subjects had been referred for emotional problems.

THE ORAL READING TESTS

In order that different aspects of the subjects' oral reading behavior could be examined, it was necessary to administer appropriate reading tests.

The Gilmore Oral Reading Test (Gilmore, 1968)

The Gilmore Oral Reading Test, Form C was selected and administered to all subjects to provide a detailed analysis of oral reading performance of all subjects in the sample. The Gilmore test results also provided performance ratings and grade equivalents for reading accuracy and comprehension ability as well as rate of reading. The rate measure was not included in the present analysis.

Organization. The Gilmore, which is administered individually, is comprised of ten paragraphs which form a

TABLE 6

DISTRIBUTION OF SUBJECTS BY AGE AND SEX

Groups	Age Range	Total Sample	Boys	Girls	Mean Chronological Age in Years and Months		
					Boys	Girls	Total Sample
Verbal Dominant	7- 1 to 7-11	5	4	1	7-6	7-7	7-5
	8- 2 to 8-11	7	4	3	8-7	8-5	8-5
	9- 0 to 9-11	13	10	3	9-5	9-4	9-4
Performance Dominant	7- 1 to 7-11	4	3	1	7-6	7-8	7-7
	8- 1 to 8- 9	7	4	3	8-3	8-3	8-3
	9- 0 to 9- 7	14	11	3	9-3	9-3	9-3

TABLE 7

ANALYSIS OF VARIANCE ON AGES FOR VERBAL DOMINANT AND PERFORMANCE DOMINANT GROUPS

Source	SS	MS	df	F	p
Between Groups	.04	.04	1	.07	< 0.79
Error	29.05	.61	48		

continuous story about incidents in a family group. Paragraphs of increasing difficulty and length are graded in vocabulary selection, sentence structure, and interest to the pupils. These are read orally by each subject up to a "ceiling" of ten or more errors. Each error is assigned to one of the following categories.

1. Substitutions. The subject substitutes a real word in place of a test word.

2. Mispronunciations. The subject produces a nonsense word to replace the test word.

3. Word Pronounced by the Examiner. A word on which the subject hesitates for longer than five seconds. The word is then pronounced by the examiner.

4. Disregard of Punctuation. The subject fails to observe punctuation.

5. Insertions. One or more words are added to the text of the passage by the subject.

6. Hesitations. The subject makes a pause of at least two seconds before pronouncing a word.

7. Repetitions. A word, part of a word, or group of words is repeated by the subject.

8. Omissions. One or more words are omitted from the text version of the passage by the subject.

Five comprehension questions follow each paragraph and are to be asked and answered orally. Questions are of the recall type and refer to information specifically given

in the paragraph. Increasing skill in comprehension is related to increasing difficulty of material.

Validity and reliability. A comparison of scores on the Gilmore test and similar tests by Gray and Durrell report validity correlations ranging from .80 to .39 with the highest correlations for accuracy and the lowest for speed (Buros, 1968, citing Duggins, p. 257). High reliability for accuracy scores (.89, .85 and .84), and lower reliability for comprehension (.68, .67 and .52) using alternate-forms correlations are also reported (Buros, 1968, citing Reynolds, p. 258).

Word Lists Test

One fundamental concern of this study was to determine whether a difference in reading behavior might be exhibited by Verbal Dominant children and Performance Dominant children when reading words presented in list format and reading these same words in stories. In order to measure this aspect of oral reading behavior it was essential to construct word lists based on words read in stories.

Organization. Word lists recording all of the words found in corresponding paragraphs of the Gilmore Oral Reading Test were prepared by the researcher. Because the Gilmore is comprised of ten paragraphs it was necessary to construct ten word lists. Words that occurred

more than once in a story were not recorded more than once on the corresponding word list. Each word list was read aloud by the subject. Errors occurring in the reading of the Word Lists Test were assigned to one of these categories.

1. Substitutions - The subject substitutes a real word for the test word.

2. Mispronunciations - A nonsense word is given for the test word.

3. Omissions - The subject is unable to produce a response within a period of five seconds.

DATA COLLECTION

The collection of data pertaining to the oral reading performance of the children in the sample was done during May 1974. All reading tests were administered individually by the researcher. Each testing session took approximately fifteen to twenty minutes depending on the number of passages read from the Gilmore Oral Reading Test protocols by each subject. Space for testing was made available in each of the thirty-nine schools in order to ensure some privacy for the examiner and subject. All tests were administered during regular school hours. An audio tape was prepared for each testing session.

Administration and Scoring of Tests

Initially, during the testing sessions, an

attempt was made to establish rapport and to help the subject feel at ease. The researcher then presented the subject with the first list of the Word Lists Test. The subject read the word list aloud and then proceeded with the corresponding Gilmore passage. On completion of the paragraph the Gilmore comprehension questions were responded to orally by the subject. Testing continued in this manner, alternating between a word list and its appropriate passage until a "ceiling" of ten or more errors was reached during the reading of a paragraph.

The samples of oral reading for both the word lists and paragraphs as well as comprehension questions and responses were audio taped. This made it possible to record and calculate the oral reading performance of subjects under more strict laboratory conditions. Each subject's errors on the Word Lists Test and the Gilmore Oral Reading Test were identified, classified according to the categories previously noted, and transcribed onto test copy sheets.

In addition to the categories of errors provided by the Gilmore and the Word Lists Test, a further analysis of oral reading behavior was considered. Self corrections of errors were recorded and categorized. These self corrections were considered to be an attempt by the subject to change an original incorrect response to one that corresponded with the printed text.

All taped oral reading samples were rechecked by the researcher. Once the analyses had been completed the samples were submitted to an independent judge who randomly selected the taped readings of ten subjects, five Verbal Dominant children and five Performance Dominant children. The errors and self corrections were again classified and recorded. A comparison of these results with those of the researcher indicated a high percent of agreement.

Directions provided by the publisher of the Gilmore Oral Reading Test were followed in determining individual word accuracy and comprehension scores. Test norms were then used to compute equivalent grade levels for both categories for each subject. These data were used in comparing the oral reading performance of the Verbal Dominant and Performance Dominant groups in the study.

STATISTICAL ANALYSIS OF DATA

The data for this study were analyzed using the following statistical procedures.

Test of Significance of the Difference Between Two Independent Proportions (Ferguson, 1959, pp. 146-148)

The test was used to determine the significance of differences between proportions for types of errors and types of self corrected errors in paragraphs and in word lists, and for categories of words read in lists and then in paragraphs.

One-Way Analysis of Variance

One-way analysis of variance was used to determine whether differences in age, reading accuracy and comprehension, total number of errors and of self correction of errors in lists and in paragraphs for the two groups were significant.

Chapter IV

ANALYSIS AND INTERPRETATION OF THE FINDINGS

The purpose of this chapter is to present the results of the analyses of the oral reading behavior of subjects identified as Verbal Dominant and Performance Dominant on the basis of their performance on the Wechsler Intelligence Scale for Children (WISC). To facilitate the presentation of the findings and their interpretation, the findings of the analyses are presented according to the four major research questions which guided the study.

Research Question I

The first research question asks whether or not there will be differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects, when oral reading performance is measured according to the subjects' scores for reading accuracy and reading comprehension on the Gilmore Oral Reading Test (Gilmore). In order to explore the answer to research question one, two null hypotheses were formulated and subsequently subjected to statistical analysis using a one-way analysis of variance.

Null Hypothesis 1a. There will be no significant differences in the oral reading behavior

of Verbal Dominant children and Performance Dominant children when performance is determined by reading accuracy scores on the Gilmore Oral Reading Test.

Means and variances of the two groups are reported in Table 8. Examination of Table 8 shows that Verbal Dominant children attained higher scores in oral reading accuracy than did the Performance Dominant children. The within group variance for the Verbal Dominant group, however, is nearly three times that of the Performance Dominant group. The difference between variances for the two independent samples was therefore tested by finding the ratio of the two variance estimates (Ferguson, 1971, p. 166). Calculation of the F ratio was carried out by placing the larger of the two variance estimates in the numerator and the smaller in the denominator ($\frac{3.13}{0.84}$ Table 8). The F of 3.71 was found to exceed the critical F of 2.66 for twenty-four degress of freedom at the .02 level of confidence. The difference between variances for the two groups can therefore be considered statistically significant ($p < 0.02$).

Lack of homogeneity of variance indicates the need for caution in interpretation of the significance of differences between means (Ferguson, 1959, p. 240). However with the equal number of observations in the sample the F distribution is robust with respect to violation of the assumption of homogeneity of variance (Lindquist, 1953, pp. 85-86, citing Norton).

TABLE 8

MEAN SCORES AND VARIANCES ON READING ACCURACY IN PARAGRAPHS

Groups	Mean	Variance*
Performance Dominant	2.58	0.84
Verbal Dominant	3.46	3.13

*$F = \frac{3.13}{0.84} = 3.71$, $p < 0.02$ (Ferguson, 1971, p. 166)

The results of a one-way analysis of variance are shown in Table 9 and indicate significant differences between scores for the two groups in reading accuracy ($p < 0.05$). Verbal Dominant children attained a significantly higher level in accuracy than did Performance Dominant children. Therefore null hypothesis 1a is rejected.

Null Hypothesis 1b. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by reading comprehension scores on the Gilmore Oral Reading Test.

The means for Verbal Dominant and Performance Dominant groups presented in Table 10 indicate a difference in performance in reading comprehension. Although Verbal Dominant children have attained a higher level in comprehension scores, the variance for this group is approximately twice that of the Performance Dominant group. The difference between variances for the two independent samples was tested (Ferguson, 1971, p. 166). The F of 2.09 was not found to be statistically significant at the .02 level of confidence. Table 11 shows the significance of the difference between means for the two groups. Verbal Dominant children attained a significantly higher level in reading comprehension ($p < 0.02$) than did Performance Dominant children. Null hypothesis 1b is therefore rejected.

TABLE 9

ONE-WAY ANALYSIS OF VARIANCE ON READING ACCURACY IN PARAGRAPHS FOR PERFORMANCE DOMINANT AND VERBAL DOMINANT GROUPS

Source	SS	MS	df	F	p
Between Groups	9.59	9.59	1	4.83	<0.05
Error	95.36	1.99	48		

TABLE 10

MEAN SCORES AND VARIANCES ON ORAL READING COMPREHENSION

Groups	Mean	Variance*
Performance Dominant	2.55	1.81
Verbal Dominant	3.65	3.81

* $F = \frac{3.81}{1.81} = 2.09$, $p > 0.02$, Not Significant (Ferguson, 1971, p. 166).

TABLE 11

ONE-WAY ANALYSIS OF VARIANCE ON ORAL READING COMPREHENSION FOR PERFORMANCE DOMINANT AND VERBAL DOMINANT GROUPS

Source	SS	MS	df	F	p
Between Groups	15.23	15.23	1	5.42	<0.02
Error	134.84	2.81	48		

Discussion

These findings suggest that Verbal Dominant subjects perform at a significantly higher level of achievement in reading than do Performance Dominant subjects. These results support findings by Wells (1971) who also reported that significant differences existed between reading scores and WISC profile patterns in favor of those children with a dominant Verbal IQ.

Significant differences in the oral reading accuracy scores on the Gilmore for the two groups suggest that Verbal Dominant subjects are better able to handle the word perception task in reading aloud than are the Performance Dominant subjects. Since total accuracy scores reveal very little about the nature of the problem, research question two, which follows, explores a number of different aspects of the oral reading behavior of these two groups of subjects.

Research Question II

The second research question asks whether or not there will be differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance on the Gilmore Oral Reading Test is measured according to

1. the total number of errors in paragraph reading,

2. the nature of the error, including

(a) substitutions

(b) mispronunciations

(c) words pronounced by the examiner

(d) disregard of punctuation

(e) insertions

(f) hesitations

(g) repetitions

(h) omissions,

3. the total number of self corrections of errors in paragraph reading,

4. the nature of the self corrected error.

Four null hypotheses were formulated in order to explore the answer to research question two, and were then subjected to statistical analyses using Fisher's z values and one-way analysis of variance.

Null Hypothesis 2a. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the total number of errors in paragraph reading.

The total number of errors for every one hundred words of oral paragraph reading was calculated for the two groups. Table 12 presents the mean scores and variances of the Performance Dominant and Verbal Dominant groups on total errors in paragraphs. The results indicate that Performance Dominant children made more errors in paragraph reading than Verbal Dominant children. However, the

TABLE 12

MEANS AND VARIANCES ON TOTAL NUMBER OF ERRORS IN PARAGRAPH READING

Groups	Mean	Variance*
Performance Dominant	19.09	101.87
Verbal Dominant	13.45	34.82

*$F = \frac{101.87}{34.82} = 2.92$, $p < 0.02$ (Ferguson, 1971, p. 166).

within group variance of the Performance Dominant group is almost three times that of the Verbal Dominant group. An F ratio was calculated to determine the significance of the differences between variances (Ferguson, 1971, p. 166). The F of 2.92 was found to exceed the critical F of 2.66 for twenty-four degrees of freedom at the .02 level.

In order to further explore the significance of differences in the means for total number of errors made by Performance Dominant and Verbal Dominant groups in paragraph reading, an analysis of variance was carried out. The results are shown in Table 13 and indicate the presence of a significant difference between the two groups for total number of errors ($p < 0.02$). The possibility that the significance level observed may be affected by the lack of homogeneity of the variances of the two groups is not considered serious because of equal observations in the sample (Lindquist, 1953, pp. 85-86, citing Norton). On the basis of these findings null hypothesis 2a is rejected.

Null Hypothesis 2b. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the nature of the error in paragraph reading, including

(a) substitutions
(b) mispronunciations
(c) words pronounced by the examiner
(d) disregard of punctuation
(e) insertions
(f) hesitations
(g) repetitions

TABLE 13

ONE-WAY ANALYSIS OF VARIANCE ON TOTAL NUMBER OF ERRORS IN PARAGRAPH READING FOR PERFORMANCE DOMINANT AND VERBAL DOMINANT GROUPS

Source	SS	MS	df	F	p
Between Groups	399.04	399.04	1	5.84	<0.02
Error	3280.45	68.34	48		

(h) omissions.

Further information concerning oral reading behavior on paragraphs was obtained by examining the types and proportions of types of errors made by the two groups. Proportions were calculated by dividing the number of errors in each category (substitutions, mispronunciations, insertions and so on) by the total number of errors for each group. All proportions are expressed in decimal form. Table 14 presents the proportional distribution and significance of differences between proportions for types of errors made in paragraph reading by the two groups. The highest proportion (.50) of all errors occurred with substitutions made by Performance Dominant subjects. Although Verbal Dominant children do not appear to make as many substitutions (.36), they do display a tendency toward a greater number of errors involving mispronunciations, disregard of punctuation, insertions, repetitions and omissions than do Performance Dominant children. Conversely the Performance Dominant group show significantly less mispronunciations, punctuation errors, repetitions and omissions. A significant difference ($p < 0.01$) was also found in the ability of these two groups of children to produce a response within a five second time limit. The highest proportion (.11) of words pronounced by the examiner occurred with the Performance Dominant group.

TABLE 14

PROPORTIONAL DISTRIBUTION AND SIGNIFICANCE OF DIFFERENCES BETWEEN PROPORTIONS OF TYPES OF ERRORS IN PARAGRAPH READING

Type of Error	Groups		z	p
	Performance Dominant	Verbal Dominant		
Substitutions	.50	.36	4.6	<0.001
Mispronunciations	.08	.12	2.5	<0.02
Words Pronounced by Examiner	.11	.06	3.3	<0.01
Disregard of Punctuation	.02	.05	2.4	<0.02
Insertions	.02	.04	1.7	N.S.*
Hesitations	.08	.04	3.0	<0.01
Repetitions	.15	.23	3.5	<0.001
Omissions	.05	.11	3.6	<0.001

* N.S. Not significant at the .05 level.

Fisher's z values were calculated in order to determine whether significant differences existed between the proportions. Results presented in Table 14 show that the only category of error which does not display significant differences between the two groups is that of insertions. Therefore, null hypothesis 2b is rejected when performance is determined by substitutions, mispronunciations, words pronounced by the examiner, disregard of punctuation, hesitations, repetitions and omissions.

Null Hypothesis 2c. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the total number of self corrections of errors in paragraph reading.

Table 15 shows the means and variances for the two groups on the total number of self corrections in paragraph reading. Although the mean for Performance Dominant children is slightly higher than that for Verbal Dominant children, a one-way analysis of variance, presented in Table 16, indicates no significant difference between the two groups of children on mean self corrections in paragraph reading. Thus null hypothesis 2c is not rejected.

Null Hypothesis 2d. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the nature of the self corrected error in paragraph reading, including

(a) self correction of substitutions

TABLE 15

MEANS AND VARIANCE ON TOTAL NUMBER OF SELF CORRECTIONS FOR PERFORMANCE DOMINANT AND VERBAL DOMINANT GROUPS IN PARAGRAPH READING

Groups	Mean	Variance*
Performance Dominant	2.45	2.97
Verbal Dominant	2.15	2.54

* $F = \frac{2.97}{2.54} = 1.17$, $p > 0.02$, Not Significant (Ferguson, 1971, p. 166).

TABLE 16

SUMMARY OF ONE-WAY ANALYSIS OF VARIANCE ON TOTAL NUMBER OF SELF CORRECTIONS IN PARAGRAPH READING

Source	SS	MS	df	F	p
Between Groups	1.13	1.13	1	.41	<0.53*
Error	132.37	2.76	48		

* An F of 1.96 is required for significance at the .05 level.

(b) self correction of mispronunciations
(c) self correction of disregard of punctuation
(d) self correction of insertions
(e) self correction of omissions.

A comparison of proportions of types of self corrections yielded similar results to the comparison of the total number of self corrections of Verbal Dominant and Performance Dominant children. Table 17 shows the proportions for self corrections on substitutions, mispronunciations, disregard of punctuation, insertions and omissions in paragraph reading. It also presents, where applicable, z values calculated to detect significant differences between the proportions.

Examination of the proportional distribution of types of self corrections in Table 17 reveals that the Performance Dominant group had least self corrections occurring with disregard of punctuation (.01) and most self corrections occurring with substitutions (.72). Similarly, Verbal Dominant children had least self corrections occurring with disregard of punctuation (.03) and insertions (.03) and most self corrections occurring with substitutions (.71). The biggest difference between proportions for the two groups occurs with self corrections of insertions (.07 for Performance Dominant children and .03 for Verbal Dominant children). Statistical analysis using Fisher's z values reveals that significant differences do not exist between proportions of self corrections

TABLE 17

PROPORTIONAL DISTRIBUTION AND SIGNIFICANCE OF DIFFERENCES BETWEEN PROPORTIONS OF SELF CORRECTIONS ON TYPES OF ERRORS IN PARAGRAPH READING

Type of Self Correction	Groups		z	p
	Performance Dominant	Verbal Dominant		
Substitutions	.72	.71	.19	N.S.*
Mispronunciations	.08	.09	.18	N.S.
Disregard of Punctuation	.01	.03	.86	N.A.**
Insertions	.07	.03	.97	N.A.
Omissions	.12	.14	.43	N.S.

* N.S. Not significant at the .05 level.

** Not applicable when the smaller value of N times a sample value of a proportion (p) does not equal five (Ferguson, 1959, p. 147). Punctuation = 87 x .021 = 1.827; Insertions = 87 x .052 = 4.524.

for substitutions, mispronunciations and omissions in paragraph reading for the two groups. The z values calculated for self corrections of punctuation and insertion errors cannot be interpreted as unit-normal-curve deviates (Ferguson, 1959, p. 147), therefore a level of significance is not applicable for these two categories. Findings indicate that null hypothesis 2d is not rejected.

Discussion

Performance Dominant children made more errors per one hundred words in paragraph reading than did Verbal Dominant children. Moreover, these same children made significantly more substitutions and hesitations than did Verbal Dominant subjects. They also required prompting from the examiner more frequently. This may indicate that Performance Dominant children have not developed efficient word analysis skills or the skill of attacking and reading a word within a reasonable time limit. Conversely, Verbal Dominant children made significantly more mispronunciations, disregard of punctuation, repetitions and omissions in paragraph reading than did Performance Dominant children.

Although Verbal Dominant children made significantly more repetitions than did Performance Dominant children, they did not self correct their errors significantly more often. This finding does not support findings by K. Goodman who reported that repetitions or regressions

are most often made for the purpose of correcting previous reading (K. Goodman, 1965, p. 642). Nor did the Verbal Dominant group tend to self correct one type of error significantly more often than did the Performance Dominant group. It may be that Verbal Dominant children self correct errors covertly without exhibiting an overconcentration on errors in their oral reading.

It should be noted that the types of errors made in paragraph reading were not committed exclusively by one group. Both Verbal Dominant and Performance Dominant groups recorded errors in all categories. This finding supports those of Malmquist (1958) who found no differences in the types of errors made by children of varying reading ability.

Two trends were apparent in the self correction behavior of the two groups of children. First, both Verbal Dominant and Performance Dominant children tend to self correct substitution errors far more frequently than mispronunciation, punctuation, insertion and omission errors. This trend is not surprising in view of the finding that both groups tend to make more substitution errors than all other types. Second, although Verbal Dominant children tend to make more insertions than Performance Dominant children, the greatest difference between the two groups in proportions of types of self corrected errors occurs with insertions which are corrected more often by

Performance Dominant children than by Verbal Dominant children.

Findings for research question two revealed significant differences between the two groups in their oral reading behavior for words in context. Whether similar differences exist for words in isolation will be examined in research question three.

Research Question III

The third research question asks whether or not there will be differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance on the Word Lists Test is measured according to

1. the total number of errors for words in isolation,
2. the nature of the error, including
   (a) substitutions
   (b) mispronunciations
   (c) omissions,
3. the total number of self corrections of errors for words in isolation,
4. the nature of the self corrected errors.

Four null hypotheses were formulated in order that the answer to research question three might be explored. Statistical analyses using Fisher's z values and one-way analysis of variance were subsequently applied.

Null Hypothesis 3a. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the total number of errors for words in isolation.

The number of errors per one hundred words read in word lists for Verbal Dominant and Performance Dominant subjects was tallied. Table 18 presents the mean scores and variances for each of these groups on total errors in word lists. As indicated, the mean score for the Performance Dominant group is greater than that of the Verbal Dominant group. This suggests that differences between the two groups on number of errors do exist and that Performance Dominant subjects had greater difficulty in recognizing or sounding out words on lists than did the Verbal Dominant subjects. Because the variance of the Performance Dominant group is approximately twice that of the Verbal Dominant group the difference between variances for the two groups was tested. The F of 2.13 was not found to exceed the critical value of 2.66 for twenty-four degrees of freedom at the .02 level of confidence.

In order to further analyze the number of errors occurring in word lists, a one-way analysis of variance was carried out to determine if differences between means for the two groups were significant. The results are shown in Table 19 and indicate a statistically significant difference between the groups on number of errors in word

TABLE 18

MEAN SCORES AND VARIANCES ON TOTAL NUMBER OF ERRORS ON WORD LISTS

Group	Mean	Variance*
Performance Dominant	22.12	108.02
Verbal Dominant	12.41	50.83

* $F = \frac{108.02}{50.83} = 2.13$, $p > 0.02$, Not Significant.

TABLE 19

ONE-WAY ANALYSIS OF VARIANCE ON TOTAL NUMBER OF ERRORS IN WORD LISTS FOR PERFORMANCE DOMINANT AND VERBAL DOMINANT GROUPS

Source	SS	MS	df	F	p
Between Groups	1176.4	1176.4	1	14.8	<0.001
Error	3812.5	79.4	48		

lists ($p < 0.001$). Null hypothesis 3a is therefore rejected.

Null Hypothesis 3b. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the nature of the error for words in isolation, including
(a) substitutions
(b) mispronunciations
(c) omissions.

Comparison of errors dichotomized as either responses that differed from the text (substitutions and mispronunciations), or as omissions, also reveals significant differences between the two groups in oral reading behavior. Table 20 presents the proportion for each error occurring in the Word Lists Test for each group. It should be noted that although the Verbal Dominant group had significantly higher proportions on mispronunciations (.26) and omissions (.07) the Performance Dominant group displayed a distinct tendency to a higher proportion of substitutions (.74). The z values indicated in Table 20 reveal that statistically significant differences exist between the proportions of substitutions ($p < 0.01$) and mispronunciations ($p < 0.05$) for the two groups. Thus null hypothesis 3b is rejected when performance is determined by substitution and mispronunciation errors for words in isolation.

TABLE 20

PROPORTIONAL DISTRIBUTION OF TYPES OF ERRORS FOR PERFORMANCE DOMINANT AND VERBAL DOMINANT GROUPS ON THE WORD LISTS TEST

Type of Error	Groups: Performance Dominant	Groups: Verbal Dominant	z	p
Substitutions	.74	.67	2.62	<0.01
Mispronunciations	.20	.26	2.27	<0.05
Omissions	.06	.07	.56	N.S.*

* N.S. Not significant at the .05 level of confidence.

Null Hypothesis 3c. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the total number of self corrections of errors for words in isolation.

Examination of Table 21 shows that no apparent differences exist between the Performance Dominant and Verbal Dominant groups in their tendency to self correct errors in word lists. Although inequality is shown in variances for the two groups with greater variability occurring within the Verbal Dominant subjects, the ratio of the largest variance to the smallest does not exceed the critical F ratio of 2.66 needed to be significant at the .02 level.

The results of a one-way analysis of variance presented in Table 22 indicate that the observed differences between the two groups on the total number of self corrections for words in lists are not significant. Thus null hypothesis 3c is not rejected.

Null Hypothesis 3d. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the nature of the self corrected errors for words in isolation, including
(a) self correction of substitutions
(b) self correction of mispronunciations.

Although observed differences between Verbal Dominant children and Performance Dominant children for total number of self corrections of errors on words in list format were not significant, further analysis of self

TABLE 21

MEAN SCORES AND VARIANCES ON TOTAL NUMBER OF SELF CORRECTIONS ON THE WORD LISTS TEST

Group	Mean	Variance*
Performance Dominant	1.97	2.50
Verbal Dominant	1.94	5.05

* $F = \frac{5.05}{2.50} = 2.02$, $p > 0.02$, Not Significant (Ferguson, 1971, p. 166).

TABLE 22

ONE-WAY ANALYSIS OF VARIANCE ON TOTAL NUMBER OF SELF CORRECTIONS ON THE WORD LISTS TEST FOR PERFORMANCE DOMINANT AND VERBAL DOMINANT GROUPS

Source	SS	MS	df	F	p
Between Groups	.01	.01	1	.004	<0.95*
Error	181.05	3.77	48		

* An F of 1.96 is required for significance at the .05 level.

correction behavior was carried out to determine whether differences existed in the types of errors which were self corrected by subjects in the two groups. Table 23 indicates the proportional distribution for self correction of substitutions and mispronunciations and the significance of differences between proportions of self corrections. It appears that the highest proportion of self corrections for both groups occurred with substitution errors. It also appears that Verbal Dominant subjects tended to correct a slightly higher proportion of substitution errors and a slightly lower proportion of mispronunciation errors than did the Performance Dominant subjects. Z values were calculated to detect whether these differences in proportions were statistically significant. Results indicate that significant differences do not occur in proportions of self corrected substitution errors or mispronunciation errors for the two groups. Therefore null hypothesis 3d is not rejected.

Discussion

The results suggest that quantitative differences exist in the oral reading behavior of Verbal Dominant and Performance Dominant children. Verbal Dominant children tend to make less errors per one hundred words on lists than do Performance Dominant children.

Again it was apparent that the types of errors committed were not mutually exclusive to one particular

TABLE 23

PROPORTIONAL DISTRIBUTION AND SIGNIFICANCE OF DIFFERENCES BETWEEN PROPORTIONS FOR SELF CORRECTION OF SUBSTITUTION AND MISPRONUNCIATION ERRORS

Type of Error	Groups		z	p
	Performance Dominant	Verbal Dominant		
Substitutions	.82	.85	*.468	N.S.*
Mispronunciations	.18	.15	.455	N.S.

* N.S. Not significant at the .05 level of confidence.

group of children. Although both groups of children made more substitutions than mispronunciations or omissions, Performance Dominant children made significantly more substitutions than did Verbal Dominant children. Similarly, both groups of children made mispronunciation errors but Verbal Dominant children did so significantly more often than did Performance Dominant children. This may indicate a difference by children in each group in the processing of information or it may indicate that Verbal Dominant children are more proficient readers than are Performance Dominant children.

Differences between the two groups in their self corrective behavior for words on lists were not apparent. This is not surprising in view of the lack of clues for word identification other than those which existed within the words themselves. Thus Performance Dominant children, who as a group made significantly more errors on words in isolation than did Verbal Dominant children, were found to correct as many errors as Verbal Dominant children. Differences in the number of uncorrected errors for the two groups may have yielded somewhat different results. However, this aspect of oral reading performance was not dealt with in this study but remains a topic of concern for future research.

One of the main interests of the present study concerned the ability of Verbal Dominant and Performance

Dominant children not only to recognize words in lists but to read these same words in paragraphs. A comparison of errors on the Word Lists Test and corresponding words in the Gilmore Oral Reading Test was indicated. This then became the topic of investigation in research question four.

Research Question IV

The fourth research question asks whether or not there will be differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance on the Word Lists Test and then on the Gilmore Oral Reading Test is measured according to categories.

1. Words missed on lists and words missed in paragraphs

2. Words corrected on lists but missed in paragraphs

3. Words missed on lists but corrected in paragraphs

4. Words corrected on lists and read correctly in paragraphs.

In order to investigate the answer to research question four one null hypothesis was formulated and subsequently subjected to statistical analysis using Fisher's z values.

Null Hypothesis 4. There will be no significant differences in the oral reading behavior of Verbal Dominant children and Performance Dominant children when performance is determined by the categorization of errors for words read in lists and then in paragraphs, including categories

1. Words missed on lists and words missed in paragraphs
2. Words corrected on lists but missed in paragraphs
3. Words missed on lists but corrected in paragraphs
4. Words corrected on lists and read correctly in paragraphs.

Table 24 presents a categorization of proportions of the total number of errors made by each group when reading words in lists and when reading these same words in context. Fisher's z values are reported to show whether significant differences exist between the proportions of the two groups. Examination of Table 24 shows that the highest proportions for the two groups are in the category indicating the ability of children to read words in stories which they could not recognize in lists. Although a slight difference is shown between proportions in this category, the difference is not significant. Thus both Performance Dominant children and Verbal Dominant children appear to read words correctly in a passage that had initially not been recognized in a word list.

The greatest difference between the groups appears to lie in their tendency to miss words in context that have also been missed on word lists. As indicated in Table 24, Performance Dominant children have a higher

TABLE 24

PROPORTIONAL DISTRIBUTION AND SIGNIFICANCE OF DIFFERENCES IN PROPORTIONS OF ERRORS ON WORDS READ IN LISTS AND THEN IN PARAGRAPHS

Categories of Errors	Groups		z	p
	Performance Dominant	Verbal Dominant		
Words missed on lists and words missed in paragraphs	.42	.38	1.54	N.S.*
Words corrected on lists but missed in paragraphs	.01	.01	.86	N.S.
Words missed on lists but corrected in paragraphs	.47	.49	.73	N.S.
Words corrected on lists and read correctly in paragraphs	.10	.12	1.35	N.S.

* N.S. Not significant at the .05 level of confidence.

proportion of errors (.42) in this category than do Verbal Dominant children (.38). However, the difference between the proportions is not significant.

Once errors have been corrected in word lists, it appears that both groups of children have a tendency to read those same words correctly in paragraphs rather than to miss them again. Although Verbal Dominant children revealed a slightly higher proportion of errors corrected on lists and read correctly in stories, again, this proportion (.12) is not significantly different from that of Performance Dominant children (.10) in the same category. On the basis of the above findings null hypothesis 4 is not rejected.

Discussion

K. Goodman (1965), in his study of the oral reading behavior of 100 first, second and third grade children, investigated the ability of these children to recognize words on word lists and read the words in stories taken from a reading series unfamiliar to the children. His expectation was that children would be able to read words in stories which they had not previously recognized in list format because of additional clues to word identification available in the flow of language. Briefly, his findings were that children in his study could read many words in context which they had either missed or read incorrectly on lists. Goodman's findings are supported by findings of

the present research which show that both Verbal Dominant and Performance Dominant children tend to read correctly in context those words which they missed on lists. Thus both Performance Dominant and Verbal Dominant children appear to use the information available in context for word identification.

The finding that both groups of children tend to read correctly in paragraphs those words that had been corrected in lists further supports findings by Goodman who reported that the children in his study did not miss consistently a word in a story that had been read correctly on a list (K. Goodman, 1965, p. 641).

SUMMARY OF FINDINGS

Statistical analysis using one-way analysis of variance revealed that children classified as Verbal Dominant attained significantly higher levels in oral reading accuracy ($p < 0.05$) and comprehension ($p < 0.02$) than did Performance Dominant children.

Verbal Dominant and Performance Dominant groups also differed significantly on total number of errors in oral reading of paragraphs ($p < 0.02$). When types of errors for words in paragraphs were examined, highly significant differences were noted on substitutions, repetitions and omissions ($p < 0.001$). Significant differences were also apparent for words pronounced by the examiner and

hestitations ($p < 0.01$), and for mispronunciations and disregard of punctuation ($p < 0.02$).

The mean scores obtained on the Word Lists Test for total number of errors indicated that Performance Dominant children had greater difficulty in identifying words on lists than did Verbal Dominant children. A one-way analysis of variance showed that the difference between the two groups in total number of errors for words in isolation was highly significant ($p < 0.001$).

Differences in proportions of types of errors made by the two groups on word lists revealed that Performance Dominant children tend to make more subsitution errors than do Verbal Dominant children but that Verbal Dominant children tend to make more mispronunciations than do Performance Dominant children. Significant differences between proportions of substitutions and between proportions of mispronunciations for the two groups were found at the 0.01 and 0.05 levels of confidence respectively.

Z values showed that significant differences do not exist between the two groups on self correction of errors in the oral reading of paragraphs and of word lists.

A comparison of words read in lists and then in paragraphs was undertaken. The findings showed that both groups of children tend to read correctly in paragraphs those words that were missed on word lists, particularly Verbal Dominant children.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

A brief summary of the study and an outline of the main findings are presented in this chapter. In addition, conclusions drawn from the findings and the implications of these conclusions for the teaching of reading are discussed. Recommendations for further research are also made.

SUMMARY OF THE STUDY

The purpose of the study was to investigate whether or not there are differences in the oral reading behavior of children identified as Verbal Dominant and Performance Dominant on the basis of their Verbal and Performance scores on the Wechsler Intelligence Scale for Children. The study was concerned with several different aspects of the oral reading performance of these two groups of children, namely: reading accuracy and comprehension, error type and frequency of errors for words in isolation and words in context, and self corrections of errors. An attempt was also made to determine whether or not there are differences in reading performance of Verbal Dominant and Performance Dominant children when reading words in lists and then reading those same words in paragraphs.

The test sample consisted of twenty-five pairs of children identified as Verbal Dominant and Performance Dominant on the basis of scores obtained on the WISC, and matched as closely as possible on dominant WISC IQ scores, secondary WISC IQ scores, Full Scale IQ, the point difference between dominant and secondary WISC IQ scores, and chronological age. The fifty children included in the test sample were enrolled in thirty-nine schools throughout the greater Edmonton area. Complete data were gathered on thirty-six boys and fourteen girls between the ages of seven and ten years.

Intelligence test scores were determined by the Wechsler Intelligence Scale for Children which had been administered to all subjects in the test sample by school psychologists in the Edmonton Separate School System, the Edmonton Public School System and the St. Albert Protestant School District during the 1972-73 and beginning 1973-74 school years. The oral reading behavior for words in context of each child was determined by the use of the Gilmore Oral Reading Test, Form C. As it was also important to the study to determine whether or not there are differences in the oral reading of words in lists format of Verbal Dominant and Performance Dominant children, the Word Lists Test was constructed. It was then possible to compare the performance of subjects on the two groups when reading words in lists and reading those same words in paragraphs.

Chronological age for each subject was obtained from special services records in the three school systems.

All the reading tests were administered and scored by the investigator. The data collected were analyzed using statistical procedures.

MAIN FINDINGS AND CONCLUSIONS

The oral reading behavior of Verbal Dominant and Performance Dominant children for words in lists and in paragraphs according to reading achievement and other factors identified in the study are summarized below in relation to the questions posed in the study.

Research Question I

The first research question asked whether or not there are differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance is measured according to the subjects' scores for reading accuracy and reading comprehension on the Gilmore Oral Reading Test.

Differences between oral reading accuracy mean scores of Verbal Dominant and Performance Dominant children were statistically significant at the .05 level of confidence. The differences between reading comprehension scores on the Gilmore for subjects in the two groups were statistically significant at the .02 level. For both reading accuracy and reading comprehension the Verbal

Dominant subjects for this sample drawn from a clinical population performed at the higher level.

These results suggest that the Verbal Dominant subjects were more proficient than were the Performance Dominant subjects, in both oral reading accuracy and comprehension. The finding supports similar conclusions from other studies involving general reading achievement. The conclusions regarding differences in comprehension must be viewed with caution for this analysis fails to indicate whether or not the poorer comprehension scores of the Performance Dominant subjects reflect their poorer comprehension abilities or their lower performance in reading accuracy. That is, it is possible that the lower comprehension scores of the Performance Dominant group, or conversely, the higher comprehension scores of the Verbal Dominant group were due to differences in their word perception abilities rather than their cognitive processing abilities.

Research Question II

The second research question asked whether or not there are differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral reading performance on the Gilmore Oral Reading Test is measured according to

1. the total number of errors in paragraph reading,
2. the nature of the error, including
   (a) substitutions

(b) mispronunciations

(c) words pronounced by the examiner

(d) disregard of punctuation

(e) insertions

(f) hesitations

(g) repetitions

(h) omissions,

3. the total number of self corrections of errors in paragraph reading,

4. the nature of the self corrected error.

Statistical analysis of the data revealed significant differences at the .02 level of confidence between the performance of Verbal Dominant and Performance Dominant children for total number of errors in paragraph reading with the Performance Dominant children making more errors. This finding confirms the difference revealed in the comparison of the two groups on the basis of their grade level scores on accuracy as examined in research question one.

In terms of the nature of the errors made, Performance Dominant children made significantly more substitutions ($p < 0.001$), hesitations ($p < 0.01$), and had significantly more words pronounced by the examiner ($p < 0.01$) than did Verbal Dominant children. Verbal Dominant children, on the other hand, made significantly more mispronunciations ($p < 0.02$), repetitions and omissions

($p < 0.001$), and disregarded punctuation significantly more often ($p < 0.02$) than did Performance Dominant children. The difference between proportions of insertions for the two groups was not statistically significant.

While both groups of children tend to make the same types of errors in oral paragraph reading, the finding that certain types of errors were made significantly more often by Performance Dominant children than by Verbal Dominant children may indicate less effective word analysis skills or it may indicate a difference in attention to the graphic stimuli which comprise print. The latter further suggests a difference in the way the two groups process information. This can only be determined by a more thorough examination of the errors of both groups of children to investigate whether or not there are differences in the graphic similarity of errors and expected responses and in the syntactic and semantic acceptability of errors within the context.

The third part of the research question was related to the differences, if any, in the number of self corrections made by the two groups. The one-way analysis of variance on the total number of self corrections in paragraph reading revealed that there were no significant differences between means for the two groups. This finding indicates that both Verbal Dominant and Performance Dominant children have the ability to evaluate their responses

and to employ correction strategies. What cannot be determined by this analysis is whether or not there are differences in the number of uncorrected errors for the two groups of children. That is, if the sample of Performance Dominant children left uncorrected a greater proportion of errors than did Verbal Dominant children, then this would suggest less efficient self correction strategies by Performance Dominant children than by Verbal Dominant children. This in turn may be reflected in their lower level of comprehension in oral paragraph reading as indicated in research question one.

With regard to the nature of the self corrected errors, differences between proportions of self corrections of substitution, mispronunciation and omission errors for Verbal Dominant and Performance Dominant subjects were not statistically significant. The significance of differences between proportions of self corrected insertions and of self corrected punctuation errors could not be determined because of the small number of these two types of self corrected errors (Ferguson, 1959, p. 147). These results suggest that both groups of children have the ability to self correct different kinds of errors.

Research Question III

The third research question asked whether or not there are differences in the oral reading performance of Verbal Dominant and Performance Dominant subjects when oral

reading performance on the Word Lists Test is measured according to

1. the total number of errors for words in isolation,
2. the nature of the error, including
   (a) substitutions
   (b) mispronunciations
   (c) omissions,
3. the total number of self corrections of errors for words in isolation,
4. the nature of the self corrected errors.

Statistical analysis of the data for total number of errors for words in isolation revealed significant differences at the .001 level between Verbal Dominant and Performance Dominant subjects. This finding suggests that Verbal Dominant children are more efficient in their word perception abilities than are Performance Dominant children even when words are presented in isolation from the context.

When considering the nature of the errors made, differences between proportions of substitutions and between proportions of mispronunciations for the two groups were found to be statistically significant at the .01 and .05 levels respectively. The differences however, between proportions of omissions were not statistically significant. Again it is apparent that both groups of

children tend to make the same types of errors when reading words in list format. However differences in the error types made significantly more often by one group than by the other suggests again possible differences in the word attack skills of the two groups of children or differences in their attention to graphic stimuli.

With regard to the total number of self corrected errors on word lists, differences between means for Verbal Dominant and Performance Dominant children were not statistically significant. This finding confirms those results of research question two which indicated the ability of both groups of people to use correction strategies. It would appear therefore, that for these two groups of children the presentation of words in list format or paragraph format does not affect their self correction strategies.

The fourth part of the research question pertained to the differences, if any, in the type of self corrected errors in lists. Statistical analysis using Fisher's z values revealed no significant differences between proportions of self corrected substitutions and between proportions of self corrected mispronunciations for the two groups.

Research Question IV

The fourth research question asked whether or not there are differences in the oral reading performance of

Verbal Dominant and Performance Dominant subjects when oral reading performance on the Word Lists Test and then on the Gilmore Oral Reading Test is measured according to categories

1. Words missed on lists and words missed in paragraphs.

2. Words corrected on lists and missed in paragraphs.

3. Words missed on lists but corrected in paragraphs.

4. Words corrected on lists and read correctly in paragraphs.

The research question was posed to investigate whether or not the superior verbal or language centered abilities of the Verbal Dominant subjects would enable them to use context clues in paragraph reading to correctly identify those words which they had missed on lists more effectively than Performance Dominant subjects. Differences between proportions of errors on words read in lists and then in paragraphs in all categories defined in the research question were not statistically significant. A distinct trend was apparent in the tendency of both Verbal Dominant and Performance Dominant children to read correctly in paragraphs those words initially missed on lists. This reveals the ability of both groups of children to use clues available in the flow of language.

The findings would suggest that there are no differences in the oral reading performance of Verbal Dominant and Performance Dominant children when reading words in lists and then in paragraphs. However, it is possible that this failure in the present analysis to show differences may reflect an inherent weakness in the procedure used. The fact that Performance Dominant children were poorer readers and reached a ceiling of ten or more errors in paragraph reading at an earlier stage than did Verbal Dominant children, meant that the Performance Dominant subjects read material that was semantically and syntactically simpler. The performance of Verbal Dominant subjects who reached a higher level in paragraph reading reflects a more complex semantic and syntactic level in the material read.

LIMITATIONS OF THE FINDINGS

In addition to the limitations set forth in Chapter I, the following limitations may restrict the applicability of the findings of the study:

1. Due to constraints imposed by the different school boards with respect to access to information, the different procedures may have had some effect on sample selection.

2. Because there were very few Verbal Dominant subjects in the clinic population, random sampling

procedures were not possible. This further limits the generalizability of the results and interpretation.

3. Three Performance Dominant subjects originally selected to match the Verbal Dominant subjects were not available at the time of testing. The profiles of the alternatives were not as close a match.

4. The size of the sample, limited by the number of Verbal Dominant subjects in the population, restricted the interpretation of some of the questions. Because there was not enough information or data in some categories some analyses could not be carried out.

IMPLICATIONS OF THE STUDY

Within the limitations stated, several implications are suggested by the findings and conclusions based upon the analysis of this sample of Verbal Dominant and Performance Dominant subjects. Some teaching practices which might be explored with these children are suggested.

Because Verbal Dominant and Performance Dominant children do reveal rather significant differences in their oral reading behavior, it seems important that these children be identified early in their school years in order that they receive the teaching instruction which will be most helpful in teaching them to read and in overcoming any reading difficulties which they might be experiencing. This suggests the need for modification of

the reading instruction program to accommodate the differences in learners' verbal and performance abilities.

In analyzing the types of errors made significantly more often by Performance Dominant children than by Verbal Dominant children in paragraph reading it has been found that Performance Dominant children appear to be more word-bound than are Verbal Dominant children. This is interesting in view of the perceptual training often prescribed for children with reading difficulties. Integrating the use of context clues, sound-symbol relationships and meaning might prove beneficial as instructional objectives for Performance Dominant children. A language experience approach where these children dictate stories from their own experiences and interests might be used as part of the reading program to enhance the opportunities of these learners to get beyond word-bound reading. We will, of course, need to pursue further the question of matching instructional strategies with learner competencies.

The types of errors made significantly more often by Verbal Dominant children than by Performance Dominant children, and the finding that Verbal Dominant children comprehend what they read in context more readily than do children identified as Performance Dominant suggests that Verbal Dominant children have more fully integrated reading techniques and skills. However, instructional objectives could include increasing emphasis on sound-

symbol relationships within the context of what is being read. These children might be encouraged to use and increase their skills through a wide variety of more conceptually complex materials.

Like most children, both groups in this study found it more difficult to recognize words in isolation than to read these same words in context. It might be more beneficial, therefore, to teach new words in their context rather than as isolated units as is sometimes the case in certain reading instruction programs. Since the ultimate goal is to have the children read regular materials this move would seem more than justified.

SUGGESTIONS FOR FURTHER STUDY

As a result of this study the following suggestions might prove valuable in planning further research to obtain additional information concerning the reading behavior of Verbal Dominant and Performance Dominant children.

1. The sample of Verbal Dominant and Performance Dominant children in this study was restricted by the clinical population from which the sample was drawn. Since differences were noted among these groups of children that support previous research findings, this would suggest the need for further study of the specific aspects of oral reading examined in the research, but with a sample of children drawn from a less restricted population. It

is recommended that the research projects below be carried out using these broader sampling procedures.

2. Although results of this study reveal differences in the oral reading accuracy and comprehension scores on the Gilmore between Verbal Dominant and Performance Dominant subjects it cannot be determined whether these differences reflect differences in initial reading proficiency or real differences in verbal and performance abilities. Therefore there is need to conduct research which includes the variable of reading achievement or underachievement in sample selection as well as the variables used in this study. This would suggest further research to compare the reading behavior of four groups of children preferably of the same age or grade level: Verbal Dominant achievers, Verbal Dominant underachievers, Performance Dominant achievers and Performance Dominant underachievers.

3. Findings of the present study indicate that although both Verbal Dominant and Performance Dominant children make the same types of errors in paragraph reading, they also have patterns in the distribution of their error types. Further study of the errors themselves: of graphic similarity, of closeness of grapheme-phoneme correspondences and of grammatic and semantic acceptability of errors in the context should be undertaken to determine whether or not different aspects of the word analysis

instructional program should be emphasized for these two groups of learners. An instrument like Goodman's Taxonomy (K. Goodman, 1969) would provide a more complex analysis of errors and would therefore generate more information concerning the specific abilities of these learners.

4. More explicit information about the acquisition of or failure to acquire word processing strategies might be made available if a longitudinal study were carried out. This might involve a comparison of the development of Verbal Dominant and Performance Dominant children in their acquisition of word attack skills.

5. There is need of a study designed to be more analytical of comprehension skills and of literal and interpretive comprehension strategies where the word perception task is such that it can be handled adequately by the Performance Dominant group.

6. Further study to assess more extensively the ability of both Verbal Dominant and Performance Dominant children to use information from their language competence and from the flow of language in print in their self correcting strategies is needed.

CONCLUDING STATEMENT

This study investigated the oral reading behavior of Verbal Dominant and Performance Dominant children

ranging in age from seven to ten years. Findings of the study indicate that there are significant differences in their reading performance of words in isolation and words in context. Verbal Dominant children appear to be more proficient readers than are Performance Dominant children as evidenced by fewer total errors for words in lists and in paragraphs and by a higher level of comprehension of the material being read.

This study also revealed that whereas both groups of children make the same types of errors in their oral reading, certain types of errors are made significantly more often by children in their respective groups. This suggests that there are differences in their word attack skills, in their ability to use information provided by the context of material, and perhaps in their approach to the reading task.

Perhaps the major implication arising from this study is the need to examine and compare the reading abilities of these children in such a way that the information solicited can be used to plan more appropriate instructional strategies to enhance their opportunity to become good readers.

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